

AMENDMENTS TO THE CLAIMS

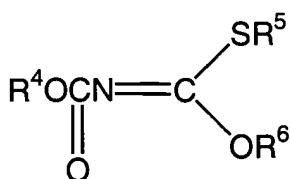
This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1-8. (canceled).

9. (withdrawn): A method of preparing an isothiocyanatoformic acid ester derivative represented by the following general formula (2):

General formula (2)

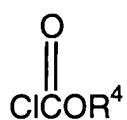


in which: R⁴ represents a substituted or non-substituted alkyl group, or a substituted or non-substituted aryl group; R⁵ represents a substituted or non-substituted alkyl group, a substituted or non-substituted aryl group, or a substituted or non-substituted heterocyclic group; and R⁶ represents a substituted or non-substituted alkyl group having at least 3 carbon atoms, or a substituted or non-substituted aryl group, the method comprising the steps of:

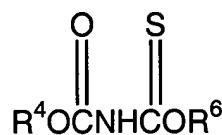
adding a chloroformic acid derivative represented by the following general formula (7) to an isothiocyanic acid salt represented by the following general formula (5) and a hydroxy derivative represented by the following general formula (8); and preparing the isothiocyanatoformic acid ester derivative from the intermediate:

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ZNCS
General formula (5)



R^6OH
General formula (6)



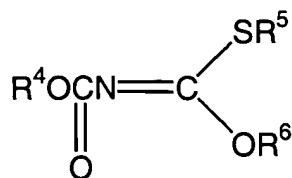
General formula (7)

General formula (8)

β1
wherein, in the general formula (5), Z represents a sodium atom or a potassium atom.

10. (currently amended): A method of preparing an isothiocyanatoformic acid ester derivative represented by the following ~~general~~ formula (2):

General formula Formula (2)

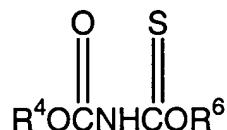


in which: R^4 represents a substituted or non-substituted alkyl group, or a substituted or non-substituted aryl group; R^5 represents a substituted or non-substituted alkyl group, a substituted or non-substituted aryl group, or a substituted or non-substituted heterocyclic group; and R^6 represents a substituted or non-substituted alkyl group having at least 3 carbon atoms, or a substituted or non-substituted aryl group, the method comprising the steps of:

preparing a first intermediate represented by the following ~~general~~ formula (8);

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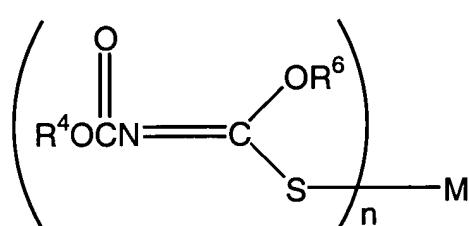
preparing a second intermediate represented by the following ~~general~~ formula (10) from the first intermediate and a compound represented by the following ~~general~~ formula (9); and preparing the isothiocyanatoformic acid ester derivative from the second intermediate:



General formula Formula (8)



General formula-Formula (9)



~~General formula~~ Formula (10)

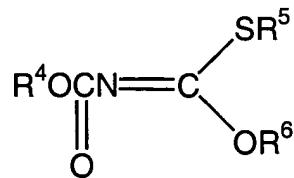
wherein, in the general formulas (9) and (10), M represents an alkali metal atom, an alkali earth metal atom, an aluminum atom or a magnesium atom, n represents an integer selected from 1 to 3, and

wherein the second intermediate represented by formula (10) is obtained as crystals.

11. (withdrawn): A method of preparing an isothiocyanatoformic acid ester derivative represented by the following general formula (2):

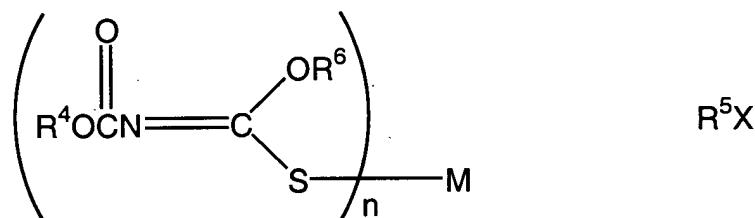
General formula (2)

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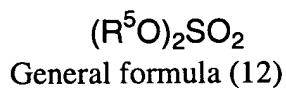
in which: R⁴ represents a substituted or non-substituted alkyl group, or a substituted or non-substituted aryl group; R⁵ represents a substituted or non-substituted alkyl group, a substituted or non-substituted aryl group, or a substituted or non-substituted heterocyclic group; and R⁶ represents a substituted or non-substituted alkyl group having at least 3 carbon atoms, or a substituted or non-substituted aryl group, the method comprising the steps of:

B1
preparing an intermediate represented by the following general formula (10); and reacting the intermediate with an alkylating agent represented by one of the following general formula (11) and the following general formula (12) for preparing the isothiocyanatoformic acid ester derivative:



General formula (10)

General formula (11)

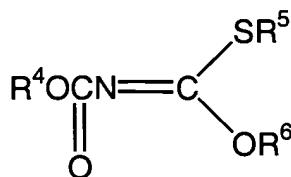


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wherein, in the general formula (10), M represents an alkali metal atom, an alkali earth metal atom, an aluminum atom or a magnesium atom, and, in the general formula (11), X represents a halogen atom or SO_3Ar , and Ar represents a substituted or non-substituted aryl group.

12. (currently amended): A method of preparing an isothiocyanatoformic acid ester derivative representative by the following ~~general~~ formula (2):

~~General formula~~ Formula (2)



in which: R^4 represents a substituted or non-substituted alkyl group, or a substituted or non-substituted aryl group; R^5 represents a substituted or non-substituted alkyl group, a substituted or non-substituted aryl group, or a substituted or non-substituted heterocyclic group; and R^6 represents a substituted or non-substituted alkyl group having at least 3 carbon atoms, or a substituted or non-substituted aryl group, the method comprising the steps of:

adding a chloroformic acid derivative represented by the following ~~general~~ formula (7) to an isothiocyanic acid salt represented by the following ~~general~~ formula (5) and a hydroxy derivative represented by the following ~~general~~ formula (6) for preparing a first intermediate represented by the following ~~general~~ formula (8);

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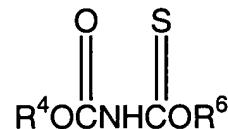
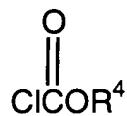
preparing a second intermediate represented by the following ~~general~~ formula (10) from the first intermediate and a compound represented by the following ~~general~~ formula (9); and preparing the isothiocyanatoformic acid ester derivative from the second intermediate:

ZNCS

R^6OH

~~General formula~~ Formula (5)

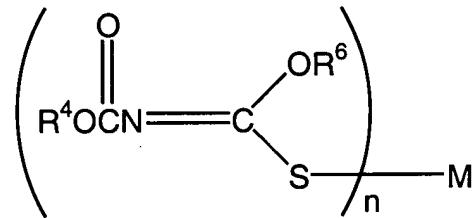
~~General formula~~ Formula (6)



~~General formula~~ Formula (7)

~~General formula~~ Formula (8)

$M(OH)_n$



~~General formula~~ Formula (9)

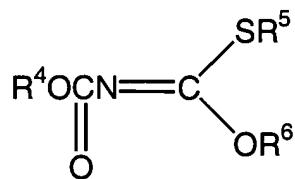
~~General formula~~ Formula (10)

wherein, in the ~~general~~ formula (5), Z represents a sodium atom or a potassium atom, and, in the ~~general~~ formulas (9) and (10), M represents an alkali metal atom, an alkali earth metal atom, an aluminum atom or a magnesium atom, n represents an integer selected from 1 to 3, and wherein the second intermediate represented by formula (10) is obtained as crystals.

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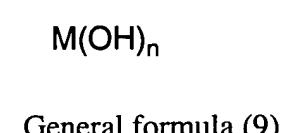
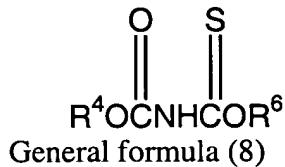
13. (withdrawn): A method of preparing an isothiocyanatoformic acid ester derivative represented by the following general formula (2):

General formula (2)

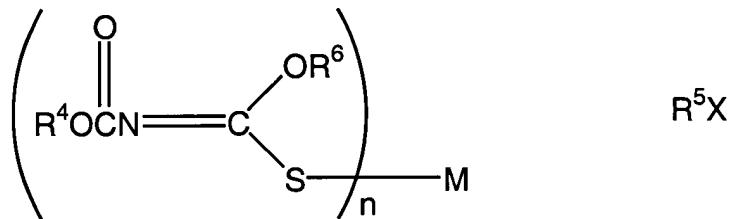


β 1 in which: R⁴ represents a substituted or non-substituted alkyl group, or a substituted or non-substituted aryl group; R⁵ represents a substituted or non-substituted alkyl group, a substituted or non-substituted aryl group, or a substituted or non-substituted heterocyclic group; and R⁶ represents a substituted or non-substituted alkyl group having at least 3 carbon atoms, or a substituted or non-substituted aryl group, the method comprising the steps of:

preparing a first intermediate represented by the following general formula (8);
preparing a second intermediate represented by the following general formula (10) from the first intermediate and a compound represented by the following general formula (9); and reacting the second intermediate with an alkylating agent represented by one of the following general formula (11) and the following general formula (12) for preparing the isothiocyanatoformic acid ester derivative:

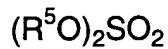


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General formula (10)

General formula (11)

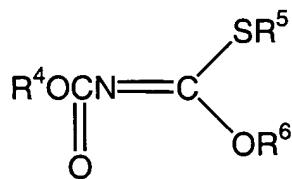


General formula (12)

wherein, in the general formulas (9) and (10), M represents an alkali metal atom, an alkali earth metal atom, an aluminum atom or a magnesium atom, and, in the general formula (11), X represents a halogen atom or SO₃Ar, and Ar represents a substituted or non-substituted aryl group.

14. (withdrawn): A method of preparing an isothiocyanatoformic acid ester derivative represented by the following general formula (2):

General formula (2)



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in which: R^4 represents a substituted or non-substituted alkyl group, or a substituted or non-substituted aryl group; R^5 represents a substituted or non-substituted alkyl group, a substituted or non-substituted aryl group, or a substituted or non-substituted heterocyclic group; and R^6 represents a substituted or non-substituted alkyl group having at least 3 carbon atoms, or a substituted or non-substituted aryl group, the method comprising the steps of:

adding a chloroformic acid derivative represented by the following general formula (7) to an isothiocyanic acid salt represented by the following general formula (5) and a hydroxy derivative represented by the following general formula (6) for preparing a first intermediate represented by the following general formula (8);

B'
preparing a second intermediate represented by the following general formula (10) from the first intermediate; and

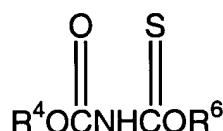
reacting the second intermediate with an alkylating agent represented by one of the following general formula (11) and the following general formula (12) for preparing the isothiocyanatoformic acid ester derivative:

ZNCS
General formula (5)

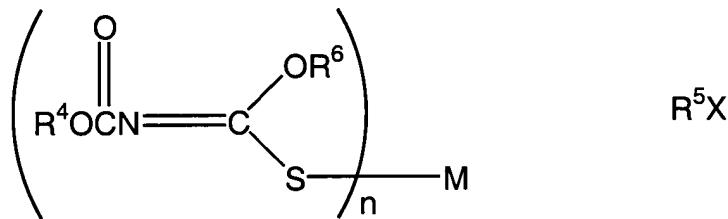


General formula (7)

$R^6\text{OH}$
General formula (6)

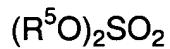


General formula (8)



General formula (10)

General formula (11)

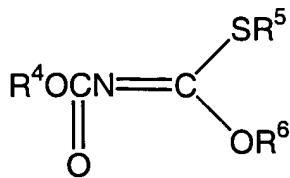


General formula (12)

wherein, in the general formula (5), Z represents a sodium atom or a potassium atom, in the general formula (10), M represents an alkali metal atom, an alkali earth metal atom, an aluminum atom or a magnesium atom, and, in the general formula (11), X represents a halogen atom or SO₃Ar, and Ar represents a substituted or non-substituted aryl group.

15. (withdrawn): A method of preparing an isothiocyanatoformic acid ester derivative represented by the following general formula (2):

General formula (2)



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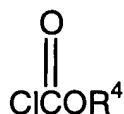
in which: R^4 represents a substituted or non-substituted alkyl group, or a substituted or non-substituted aryl group; R^5 represents a substituted or non-substituted alkyl group, a substituted or non-substituted aryl group, or a substituted or non-substituted heterocyclic group; and R^6 represents a substituted or non-substituted alkyl group having at least 3 carbon atoms, or a substituted or non-substituted aryl group, the method comprising the steps of:

adding a chloroformic acid derivative represented by the following general formula (7) to an isothiocyanic acid salt represented by the following general formula (5) and a hydroxy derivative represented by the following general formula (6) for preparing a first intermediate represented by the following general formula (8);

preparing a second intermediate represented by the following general formula (10) from the first intermediate; and

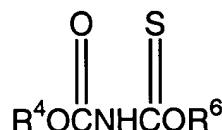
reacting the second intermediate with an alkylating agent represented by one of the following general formula (11) and the following general formula (12) for preparing the isothiocyanatoformic acid ester derivative:

ZNCS
General formula (5)



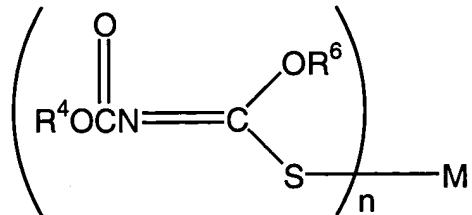
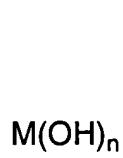
General formula (7)

$R^6\text{OH}$
General formula (6)



General formula (8)

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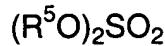


General formula (9)

General formula (10)



General formula (11)



General formula (12)

wherein, in the general formula (5), Z represents a sodium atom or a potassium atom, in the general formulas (9) and (10), M represents an alkali metal atom, an alkali earth metal atom, an aluminum atom or a magnesium atom, and, in the general formula (11), X represents a halogen atom or SO_3Ar , and Ar represents a substituted or non-substituted aryl group.